

WHAT IS CLAIMED IS:

1. An electronic watermark data insertion apparatus comprising:

frequency region converting means, supplied with an original image of one frame divided into a plurality of blocks each consisting of a plurality of pixels, for converting said original image into a frequency-converted image data of a frequency region block by block;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data;

insertion information memorizing means for memorizing insertion information for designating the electronic watermark data to be inserted corresponding to the respective blocks among said electronic watermark data stored in said electronic watermark data memorizing means;

electronic watermark data selecting means for selecting said particular electronic watermark data designated by said insertion information block by block from said electronic watermark memorizing means to produce a selected electronic watermark data; and

electronic watermark data inserting means for inserting said selected electronic watermark data in said frequency-converted image data of the frequency region to produce an electronic watermark inserted composite image data.

2. An electronic watermark insertion apparatus comprising:

frequency region converting means, supplied with an original image of one frame divided into a plurality of blocks each consisting of a plurality of pixels, for converting said original image into a frequency-converted image data of a frequency region block by block;

quantizing means for quantizing said frequency-converted image data into a quantized image data;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data;

insertion information memorizing means for memorizing insertion information for designating the electronic watermark data to be inserted corresponding to the respective blocks among said electronic watermark data stored in said electronic watermark data memorizing means;

electronic watermark data selecting means for selecting said particular electronic watermark data designated by said insertion information block by block from said electronic watermark memorizing means to produce a selected electronic watermark data;

electronic watermark data inserting means for inserting said selected electronic watermark data in said quantized image data of the frequency region to produce an electronic watermark inserted composite image data; and

Huffman coding means for carrying out a Huffman coding on said electronic watermark inserted composite image data.

3. An electronic watermark detection apparatus comprising:

insertion information memorizing means for preliminarily memorizing insertion information for designating a type of electronic watermark data to be inserted block by block in one frame divided into a plurality of blocks;

data extracting means, supplied with an electronic watermark inserted composite image divided into a plurality of blocks in which individual electronic watermark data are inserted block by block, for extracting, on the basis of said insertion information, the electronic watermark data by adding the blocks in which the same electronic watermark data are inserted to produce extracted data;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data inserted in the respective blocks;

electronic water data detecting means for calculating a statistical similarity between said extracted data and the respective electronic watermark data stored in said electronic watermark data memorizing means; and

determining means for determining, on the basis of said statistical similarity, whether or not said electronic watermark data is detected.

4. An electronic watermark detection apparatus comprising:

insertion information memorizing means for preliminarily memorizing insertion information for designating a type of electronic watermark data to be inserted block by block in one frame divided into a plurality of blocks;

data extracting means, supplied with an electronic watermark inserted composite image divided into a plurality of blocks in which individual electronic watermark data are inserted block by block, for extracting, on the basis of said insertion information, the electronic watermark data in said electronic watermark inserted composite image by adding the blocks in which the same electronic watermark data are inserted to produce extracted data;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data inserted in the respective blocks;

electronic water data detecting means for calculating a statistical similarity between said extracted data and the respective electronic watermark data stored in said electronic watermark data memorizing means;

electronic watermark data accumulating means for accumulating said statistical similarity for a predetermined time interval to produce an accumulated addition value; and

determining means for determining whether or not said electronic watermark data is detected by comparing said accumulated addition value with a predetermined threshold value.

5. An electronic watermark detection apparatus comprising:

insertion information memorizing means for preliminarily memorizing insertion information for designating a type of electronic watermark data to be inserted block by block in one frame divided into a plurality of blocks;

decoding means, supplied with a Huffman coded composite image obtained by Huffman coding an electronic watermark inserted composite image divided into a plurality of blocks in which individual electronic watermark data are inserted block by block, decoding said Huffman coded composite image block by block to produce a decoded composite image;

data extracting means for extracting, on the basis of said insertion information, the electronic watermark data in said decoded composite image by adding the blocks in which the same electronic watermark data are inserted to produce extracted data;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data inserted in the respective blocks;

electronic water data detecting means for calculating a statistical similarity between said extracted data and the respective electronic watermark data stored in said electronic watermark data memorizing means; and

determining means for determining, on the basis of said statistical similarity, whether or not said electronic watermark data is detected.

6. An electronic watermark detection apparatus comprising:

insertion information memorizing means for preliminarily memorizing insertion information for designating a type of electronic watermark data to be inserted block by block in one frame divided into a plurality of blocks;

decoding means, supplied with a Huffman coded composite image obtained by Huffman coding an electronic watermark inserted composite image divided into a plurality of blocks in which individual electronic watermark data are inserted block by block, for decoding said Huffman coded composite image block by block to produce a decoded composite image;

data extracting means for extracting, on the basis of said insertion information, the electronic watermark data in said decoded composite image by adding the blocks in which the same electronic watermark data are inserted to produce extracted data;

electronic watermark data memorizing means for preliminarily memorizing a plurality of electronic watermark data inserted in the respective blocks;

electronic water data detecting means for calculating a statistical similarity between said extracted data and the respective electronic watermark data stored in said electronic watermark data memorizing means;

electronic watermark data accumulating means for accumulating said statistical similarity for a predetermined time interval to produce an accumulated addition value; and

determining means for determining whether or not said electronic watermark data is detected by comparing said accumulated addition value with a predetermined threshold value.